CA2BCPC 90R26
British Columbia Purchasing Commission.
REQUEST FOR PROPOSALS FOR MANAGEMENT OF BIOMEDICAL WASTE
FOR THE PROVINCE OF BRITISH COLUMBIA AND GREATER
VANCOUVER REGIONAL DISTRICT. 1991.
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OR
BIOMEDICAL WASTE
R THE
PROVINCE OF BRITISH COLUMBIA
AND
GREATER VANCOUVER REGIONAL DISTRICT
RFP # 91590

Issued By:

British Columbia Purchasing Commission
4000 Seymour Place
Victoria B.C. Canada V8X 4Y3

SUMMARY OF KEY INFORMATION

1. Bidders' Meeting: on Thursday, June 28, 1990 at 10:00 AM
   at B.C. Purchasing Commission
   2nd Floor, Main Boardroom
   4000 Seymour Place
   Victoria B.C. Canada V8X 4Y3

2. Closing Date for
   Bidder Response: August 28, 1990 at 2:00 PM local time

   Send three copies of Financial Data and twelve copies General and Technical Data for each proposal.

3. Interested Bidders are advised to return the enclosed Receipt Confirmation Form immediately to ensure that they receive further information with regard to this RFP.

4. For further information contact:
   Jim Guthrie
   B.C. Purchasing Commission
   4000 Seymour Place
   Victoria, B.C. V8X 4Y3
   Telephone: (604) 389-3326
   Facsimili: (604) 387-5606

   Information offered from sources other than the above is not official and may be inaccurate. Do not contact the Ministries or Agencies involved.

5. Please use the above RFP number on all correspondence.

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APPENDICES

1. SUMMARY OF BY-GONE PROPOSALS

The Province of British Columbia (Provincial) and the Greater Vancouver Regional District (GVRD) with its municipal members (Municipal) Waste Reduction, Treatment and Disposal Options and the Strategy that Regional for Proposals to create complete solutions, from the system which each Bidder proposes and approaches.

Although provincial staff prefer the complete province-wide system that would allow the Municipalities the local economic effects are prepared to handle the portions of the complete system on conditions as follows is acceptable.

Each proposal shall be accompanied by an independent letter of credit or equivalent security in the amount of two million dollars ($2,000,000) as a proposal deposit.

The proposals will be evaluated according to the collection and transportation system, the environmentally acceptable technology, realistic price terms for providing the waste disposal facilities and services the use by the Contracting Agency, to take over the rest of the system, that first five years and the responsibility of the proponents to financial support, operate for five or six years.

The two methods for treatment are disposal of municipal waste against which proposals will be accepted, in conjunction by an approved recycling program which complies with applicable regulations and guidelines. Bio-medical waste must be sterilized, mixed and decontaminated and preferably reduced and transported before delivery to facility. Alternative methods proposed must be approved by the Contracting.

The market for the recyclables collected will come from commercial agreements with representatives selected at least by the Contracting Agency of major consumers of waste generated in British Columbia, including paper, metal, bottles and bottles.

1 SUMMARY OF REQUEST FOR PROPOSALS

The Province of British Columbia (Province) and the Greater Vancouver Regional District (GVRD) wish to establish a Province-Wide Biomedical Waste Collection, Treatment and Disposal System and are issuing this Request for Proposals to obtain complete information about the system which each Bidder considers most appropriate.

Although proposals must provide the complete province-wide system described in this RFP, participation by local businesses which are competent to handle specific portions of the complete system as subcontractors to Bidders is encouraged.

Every proposal shall be accompanied by an irrevocable letter of credit or certified cheque in the amount of two hundred thousand dollars ($200,000) as a proposal deposit.

The proposals will be evaluated according to: the collection and transportation system, the treatment/disposal technology, the firm price basis for providing the waste disposal facilities and service; the cost for the Contracting Agency to take over all or part of the system after five and ten years; and the capability of the proponent to finance, design, construct, operate for five to ten years.

The basic method for treatment and disposal of biomedical waste against which proposals will be assessed, is incineration by an approved technology which complies with applicable regulations and guidelines. Biomedical waste must be suitably incinerated or decontaminated and preferably rendered unrecognizable before delivery to landfill. Alternative treatment and disposal methods will also be considered.

It is intended that the selected final Bidder will enter into contractual agreements with representatives (referred to here as the "Contracting Agency") of major biomedical waste generators in British Columbia, including publicly funded health care facilities.

Based on the evaluation of the proposals, the Province and GVRD may exercise their right to enter into detailed negotiations with one or more of the Bidders mainly on matters of clarification. During negotiations, the terms and conditions pertaining to a potential Contract will be defined. The actual Contract will be administered by the Contracting Agency which will be defined in the near future.

It is required that the Treatment and Disposal System be designed to process at least 18,000 Kg per day of biomedical waste increasing to 20,000 Kg per day by the year 2000. The minimum biomedical waste quantity which will be supplied by hospitals is expected to total 10,000 Kg per day averaged over a calender month. Bidders are asked to outline and provide estimated costs for a system and facility to handle in addition to the basic biomedical waste, the total solid waste and liquid biomedical waste generated by health care facilities within the GVRD excluding kitchen and office waste. This would involve an additional 25,000 to 35,000 Kg per day of waste. Bidders may include under this alternative such waste from other hospitals or areas.

The selected final Bidder will provide the site(s), design, obtain all applicable approvals, supply and operate the Province-Wide Biomedical Waste Collection, Treatment and Disposal System. Performance testing of the completed Collection, Treatment and Disposal System and its components will be assumed by the Bidder selected for contract award. The Collection and Transportation System will be tested for one summer month and for one winter month to assure year-round performance. Each Treatment and Disposal Facility will be tested for one month after normal operation with detailed testing of emissions, effluents and residues over a one week period at agreed throughput rates.

A Performance Bond and an Operating Bond of $2.5 million each will be required to ensure performance and fulfillment of the design and construction of the system and of operations.

2 GENERAL INSTRUCTIONS TO BIDDERS

2.01 Origin and Objectives of Request For Proposals (RFP)

The Deputy Ministers of Environment and Health in British Columbia formed a Task Force on October 1, 1987 to investigate the management of biomedical wastes and to recommend a broad biomedical waste system for the Province. The Task Force included members from the Ministries of Environment and Health, the Greater Vancouver Regional District (GVRD), and the City of Vancouver, was chaired by John E.H. Ward, PhD., of the Ministry of Environment, and concluded its work late in 1988.

Late in 1988, the hospitals within the Greater Vancouver Regional Hospital District (GVRHD) requested assistance in finding a solution to their biomedical waste disposal needs. The District Board authorized its staff to work with the hospitals and the Province to define the requirements and standards, and to solicit proposals from the private sector leading to selection of a biomedical waste disposal solution. The objective was to provide the greatest level of environmental and health protection consistent with reliability of service and affordability of cost for biomedical waste generators within the GVRD.

In order to expedite the solution to the biomedical waste problem, GVRD established a Biomedical Waste Action Committee (BWAC), comprising representatives of the hospitals, Health and Environment Ministries and GVRD.

After the Call For Proposals for a Regional Biomedical Waste Disposal System was prepared, it was decided that this should be integrated into a Province-Wide program for Biomedical Waste Collection and Disposal throughout British Columbia.
The BWAC was replaced by a larger Biomedical Waste System Planning Committee (BWSPC) with John Ward of the Ministry of Environment and Len Hayton of GVRD as Co-Chairmen. The BWSPC comprises representatives of the following: Environment, Health and Municipal Affairs Ministries, Union of B.C. Municipalities, Greater Vancouver and Capital Regional Districts, B.C. Health Administrators Association and B.C. Health

Association. The Committee's objective is to lead the establishment of a biomedical waste system that is capable of properly managing the collection, treatment and disposal of biomedical waste generated in British Columbia.

The BWSPC which has held meetings since December, 1989, decided that its objectives could best be achieved through the issuance of this Request For Proposals (RFP) seeking the optimum solution to collection, treatment and disposal of biomedical waste generated throughout British Columbia. To facilitate the development of systems and the rate structure for biomedical waste collection, treatment and disposal, the province has been divided into six regions as shown on the map in Appendix D.

The objective of this Request For Proposals (RFP) is to obtain complete information about the Province-Wide Biomedical Waste Disposal System which each Bidder considers most appropriate; the collection and transportation system proposed, the treatment/disposal technology proposed, the firm price basis for providing the waste disposal facilities and service; the cost for the Contracting Agency to take over all or part of the system after five or ten years; and the capability of the proponent to finance, design, construct, operate for five to ten years, and assure the reliable monitored performance of the System. It is hoped that assessment of the tenders and interviews with the Bidders will reveal capabilities of the calibre desired for selection by the Province and GVRD to proceed through the final approvals process to the award of a contract for a Province-Wide Biomedical Waste Collection, Treatment and Disposal Contract. The Contracting Agency that will administer the Contract has not yet been defined.

The purpose of this RFP is to assist the Bidders in preparing their submissions by providing relevant information which has been assembled by the Task Force or is available from other sources. The requested information will assist the proposal evaluation process. Although this RFP is based on one or more central incineration facilities for biomedical waste as defined in Section 4.01, other approaches to biomedical waste disposal may be submitted for consideration. It is essential that these alternatives offer processes proven in full scale production and preferably producing no residues visually recognizable as

biomedical waste. The proponents may include a single corporate entity or a consortium of firms which could include one or more hospitals. In addition to the Biomedical Waste Collection, Treatment and Disposal System, proponents may also offer alternative systems which collect and incinerate all hospital care waste except kitchen and office waste from specific hospitals or designated areas and may include facilities which combine other hospital services such as a laundry with the waste disposal function or which incinerate non-biomedical waste in addition to the required waste disposal.

Although proposals must provide the complete scope of work described in this RFP, provincial authorities are interested in participation by local businesses which are competent to handle specific portions of the complete system as subcontractors to Bidders.

2.02 Scope of Work

2.02.01 Regions of British Columbia

For the purposes of the MOE, British Columbia is divided into six regions listed below. These regions are numbered for convenience and are shown on the map in Appendix D.

Region 1	Lower Mainland
Region 2	Vancouver Island
Region 3	Southern Interior
Region 4	Kootenay
Region 5	Northern
Region 6	Skeena

In order to compare proposals, Bidders are asked to separate the Biomedical Waste Collection, Treatment and Disposal System functions, facilities and costs by these regions to clarify the basis for the proposed uniform rate structure. The Bidder may organize the Province into different regions that would better suit his proposed province-wide system.

2.02.02 Collection and Transportation

The Bidder is to supply a description of the collection and transportation system(s) to be provided. The system(s) should integrate with the waste segregation, packaging and collection systems within hospitals. The system(s) will collect the waste at the loading

docks and discharge points of hospitals and biomedical waste generators, will monitor the waste for defective packaging or radioactive material and transport the acceptable waste to a Central Biomedical Waste Treatment and Disposal Facility or to regional or other treatment facilities if these are proposed. The Bidder is to define: the numbers and types of vehicles and refrigerated units for road transport; the extent to which other means of transport will be used including corresponding packaging and refrigerated containers; provisions for emergencies and accidents; the management, operations and maintenance organization, programs and facilities; the waste containers provided to facilitate handling, and control leakage; frequency of collection; the capital and operating cost estimates; the segregation and packaging expected to be provided by users of the system; the method of measuring the weight and charging for biomedical waste collection and transportation; costs and rates based on 5 and 10-year full service contracts, showing the transportation costs separately from those for the treatment/disposal facility; costs for a designated provincial authority to take over the collection and transportation system and facilities for one or more regions after 5 and 10 years.

2.02.03 Site Selection

The Bidder is to select and describe a suitable site(s) which the Bidder can acquire and own for the Central Biomedical Waste Treatment and Disposal Facility(ies) and sites which the Bidder can acquire and own for Regional or other facilities which have been included in the cost data submitted. If more than one site is available for a facility, order of preference with reasons is to be indicated. Pertinent characteristics of selected site(s) if applicable are to be described. Reasonable access to data in the possession of the Ministry of Environment or GVRD on potential sites will be made available to Bidders on request.

2.02.04 Site Preparation

It is intended that the successful Bidder after the selection, project approval and contract award process, will provide the site(s) and all site preparation including applicable licenses, fees, permits, soil testing, grading, on-site roads, parking, buried services, security-type fencing, landscaping, etc. Work by others, required for the site(s) offered should be indicated in the proposal such as access road, utilities, etc. An overall appearance of

landscaped site and buildings, designed to create a favourable public impact, is considered important.

2.02.05 Biomedical Waste Treatment and Disposal

It is intended that the selected final Bidder will design, obtain all applicable approvals, supply and operate one or more Biomedical Waste Treatment and Disposal Facilities to receive, weigh, offload, store, and treat biomedical waste to minimize health hazards and to dispose of resulting emissions, effluents, and solid or liquid residues in an environmentally safe and accepted manner. Each facility must have ample capacity to meet varying loads and requirements and must provide reliability of service at an affordable cost. Provision to adapt for future requirements is also desirable.

2.03 Qualifications of Bidders

The Bidder may be a single corporate entity or a consortium of firms offering the complete scope of work described, offering also additional specific services beyond the scope of work described if the Bidder considers such alternative(s) important or advantageous to his proposal by offering a broader service and/or lower unit cost.

The experience of the Bidder and his key personnel in the handling, transportation, storage, treatment, and disposal of biomedical wastes, and particularly in the design and operation of biomedical waste facilities of the type proposed, will be an important factor in the proposal evaluation process.

The Bidder's capability of financing the undertaking privately, including the site acquisition, design, approval process, bonding, procurement, construction, personnel training, facility testing, modifications if necessary and operations including all related contracts will also be an important factor in the proposed assessment process.

Each corporate entity or consortium planning to respond to this RFP must make certain that the name and address to which Addenda or other information related to this RFP is to

be sent, are provided to Jim Guthrie, BC Purchasing Commission and that a telephone number and Fax number if available are also provided so that contact can be made.

2.04 Sources, Types, and Quantity of Waste

The sources, types, and quantity of wastes are outlined under Section 4 of this RFP. Based on the data presented, the total amount of biomedical waste generated in the Province which requires special treatment and disposal methods such as those provided by a suitable waste incineration facility totals between 11,000 to 17,000 kg per day. The estimated quantities generated by hospitals in each of the six regions of the Province along with hospital locations and sizes and estimates of biomedical waste generated by other sources are given in Section 4 and Appendix A. The minimum biomedical waste quantity which will be supplied by hospitals is expected to total 10,000 Kg per day averaged over a calender month. Prior to finalizing negotiations with a selected Bidder, specific minimum quantities will be identified from each region. Private biomedical waste generators may elect to use the Contractor's disposal service or an alternative approach which complies with all provincial regulations and guidelines. It is required that the treatment and disposal system be designed to process at least 18,000 Kg per day of biomedical waste. As an alternative to the basic proposal, Bidders are asked to outline and provide estimated costs for a system and facility to handle in addition to the basic biomedical waste system, the total solid waste and infectious liquid waste generated by the health care facilities within GVRHD summarized in Appendix E excluding kitchen and office waste. Bidders may include under the alternative such waste from other hospitals or areas identified by the Bidder as willing to consider his proposed service. Some biomedical waste is already under contract and will not be available to the province-wide system until these contracts expire.

Bidders may optionally offer and completely describe alternative incineration facilities which will process other non-special waste in addition to biomedical waste where arrangements for the supply of such additional waste are made by the Bidder.

Alternative proposals will be considered which offer and describe a system incorporating the necessary collection, handling, transportation, storage, incineration, emission control, residue disposal, emergency provisions and special approvals, permits and licensing, to incinerate a stated quantity of specific special waste in addition to biomedical waste.

2.05 Receiving, Weighing, and Storage of Waste

Transportation of biomedical waste from remote locations particularly in winter may require the use of rail, sea and air transport as outlined under Section 5. The normal method of transporting and delivering biomedical waste to a Treatment and Disposal Facility is in vans and trailers which are generally refrigerated (see Section 5.03 for clarification). These will be received and unloaded at the Facility. Provision is required for determining the weight of waste and allocating processing charges to the various generators. Sufficient refrigerated storage is needed to retain waste during treatment and disposal system outages and to handle surplus during peak inputs. Methods of handling waste, from unloading through storage to feeding the treatment/disposal systems, must minimize hazards to facility personnel and the public.

2.06 Treatment of Waste

The basic method for treatment and disposal of biomedical waste against which proposals will be assessed, is incineration by an approved technology which complies with applicable regulations and guidelines. Alternative methods of treatment and disposal of biomedical waste will also be considered and are outlined under Section 6 of this RFP. The method or combination of methods selected and offered for the Facility must provide a high level of environmental and health protection consistent with reliability of service and affordability of cost.

Methods of treatment preferred for various types of biomedical waste and alternative methods which may be considered for a Treatment and Disposal Facility are summarized below:

Biomedical Waste Types	Preferred Treatment and Disposal Method	Alternative Treatment and Disposal Method
Anatomical	Incineration (ash to suitable landfill)	None recommended
Non-Anatomical	Incineration	Decontamination by steam autoclaving and disposal to suitable landfill (especially suitable for relatively small quantities)
Sharps	Incineration	Decontamination by steam autoclaving followed by grinding or solidification to render physically safe and disposal to suitable landfill
Liquid	Disposal to a sanitary sewer	Incineration where mixed with solid biomedical waste in relatively small proportion

2.07 Disposal of Solid Residues

The responsibilities associated with disposal of solid residues from the Facility, including entering contracts, assuming costs, and monitoring residue characteristics shall belong to the proponent selected after the final bidding process. Biomedical waste must be suitably incinerated or decontaminated and preferably rendered unrecognizable before delivery to landfill. Sharps must also be incinerated, ground, or solidified to render them physically safe. Bottom ash and fly ash from incineration must be kept separate and must each comply with composition requirements for landfill or be handled by an appropriate disposal

procedure. Each Bidder must describe the ash and treated waste disposal provided in accordance with pollution control objectives and permits along with the basis for stated costs defined in the proposal.

2.08 Disposal of Liquid Effluent

If in compliance with regional and municipal by-laws, liquid biomedical waste received at a Treatment and Disposal Facility may be discharged to the sanitary sewer. In addition to these liquids, liquid effluents from an alternative biomedical waste treatment process such as physical/chemical treatment, if proposed, must comply with B.C. Reg. 63/88, Special Waste Regulation Schedule 1 under the Waste Management Act (See Subsection 7.04).

Effluents from a facility located in GVRD to the sanitary sewer other than biomedical waste, must comply with the proposed discharge limits under the GVS&DD Regional Sewer Use Bylaw (see Subsection 7.05). Where there are contaminants of concern in the discharge not specifically covered in the above or under regional by-laws, the Sewage Control Manager of GVS&DD can set specific limits as deemed necessary.

Effluent discharges to the sanitary sewer other than biomedical waste from a facility in the GVRD, must comply with the appropriate regulations, by-laws and Provincial Environmental Guidelines.

2.09 Control of Emissions

Emissions from the Facility ventilation and exhaust systems must be filtered and treated as required to eliminate any discharge of hazardous or odourous substances to the atmosphere and to prevent the recycling of these to the Facility. Emissions from the treatment process such as incineration must be decontaminated by passing through an appropriate gas cleaning system as required to ensure compliance with Provincial Environmental Regulations and Guidelines, especially those relating to hydrochloric acid gas, suspended particulate, heavy metals, dioxins, and furans. Refer to the current B.C Ministry of

Environment Draft Emission Objectives for Biomedical Waste Incinerators (see table under Subsection 7.06)

2.10 Energy Byproduct

If an energy byproduct such as steam from a heat recovery boiler is contemplated for the Facility, the Bidder must indicate a suitable energy user and include the estimated cost/revenue data related to this energy recovery.

2.11 Permits and Approvals

The responsibility to obtain all required permits and approvals will be part of providing the System. Since infectious waste is designated under B.C. Reg. 63/88 Special Waste Regulation of April 1, 1988, under the Waste Management Act, the following approvals, licenses, and permits must be obtained through the Ministry of Environment:

- license to transport
- storage permit

Permits relating to emissions to the atmosphere, discharge of effluents, and landfill disposal and compliance with regional and municipal by-laws will be required.

2.12 Public Consultation

A program of public consultation is a vital component of the process ultimately leading to a successful operating Province-Wide Biomedical Waste Collection, Treatment and Disposal System. An effective program of communication provides inputs to the Contracting Agency and the selected Contractor to clarify public concerns and opinions especially in relation to environmental matters. Public consultation also affords opportunities to alleviate unwarranted opposition by correcting false impressions and fears of the unknown or by modifying aspects of the System design. The Bidder in his submission must outline the public consultation program which he proposes, who will administer the program and his related experience in similar applications and in the public hearing process.

2.13 Performance Testing and Acceptance

The responsibility for all costs, arrangements, and testing of the completed Collection, Treatment and Disposal System and its components will be assumed by the Bidder selected for contract award. The Collection and Transportation System will be tested for one summer month and for one winter month to assure year-round performance. Each Treatment and Disposal Facility will be tested for one month after reaching normal operation with detailed testing of emissions, effluents and residues over a one week period at agreed throughput rates. All modifications and retesting necessary to meet agreed operations criteria shall be to the Contractor's account.

2.14 Operations Criteria

The Bidders' experience in the successful management of biomedical waste disposal operations will be an important consideration in selecting successful Bidder(s). Several applicable factors are outlined under Section 2.22 Evaluation Factors and Section 7.07 Facility Operations.

2.15 Confidential Information in Proposal

The proposals and related data submitted by Bidders will be made available to members of the Biomedical Waste System Planning Committee, the Ministries of Environment, Health, and Municipal Affairs, B.C. Health Association, B.C. Health Administrators Association, GVRD Board, GVRD personnel and consultants who are directly involved in the assessment process. Information which is considered to be proprietary, confidential, especially sensitive, and not previously available to the public, should not be included in the "GENERAL AND TECHNICAL DATA" and only if considered essential for evaluation of the proposal should three copies clearly marked "CONFIDENTIAL" be included in the sealed proposal envelope marked "FINANCIAL DATA". Reasonable efforts will be made to avoid public distribution of the "confidential" data without prior consultation with the Bidder's representative.

2.16 Requests For Further Information and Assistance

Requests for further clarification of the Request For Proposals may be made at a Bidders' meeting scheduled for Thursday, June 28, 1990 at 10:00 AM at the B.C. Purchasing Commission 2nd Floor, Main Boardroom, 4000 Seymour Place, Victoria, B.C., Canada, V8X 4Y3 or in writing and delivered at least three weeks before the closing date to:

Jim Guthrie
B.C. Purchasing Commission
4000 Seymour Place
Victoria, B.C.
Canada
V8X 4Y3

The questions asked and replies given will be issued in writing to all recipients of the RFP document at least one week before the RFP closing date.

2.17 Additions, Deletions and Addenda

Changes to this RFP will be issued as Addenda by first class mail to all whose names and addresses are registered as recipients. All such Addenda become part of this RFP document and take precedence over the RFP document and preceding Addenda. The Addenda will become part of the contract documents in the event of a contract award.

2.18 Proposal Deposit

Every proposal shall be accompanied by an irrevocable letter of credit or certified cheque made out to the Minister of Finance in the amount of two hundred thousand dollars ($200,000) as a proposal deposit. This deposit shall become the property of the Government of British Columbia in the event that the Bidder whose proposal has not been rejected by Contracting Agency (to be identified in Addenda) withdraws the proposal after the proposal closing time or refuses to proceed to a Contract.

After preliminary evaluation of proposals, the letters of credit and certified cheques from all Bidders except those whose proposals are to receive further evaluation, will be returned. It is estimated that this time will not exceed 60 days after the proposal closing date.

2.19 Submission of Proposals and Closing Date

The proposal must contain all the information requested in this RFP document and sufficient additional data relating to the Bidder and his submission to enable a complete evaluation of the submission.

The proposal documents will include:

- three copies of the cost data requested in this RFP plus any related financial information or cost breakdown, and any information the Bidder considers highly confidential and the proposal deposit cheque or letter of credit are to be enclosed in a sealed envelope labelled:

  "Proposal for a
  Province-Wide Biomedical Waste
  Collection, Treatment and Disposal System
  FINANCIAL DATA"

- twelve copies of the general and technical data required to evaluate the Bidder's proposed biomedical waste program and his related experience to be enclosed in a sealed package labelled:

  "Proposal for a
  Province-Wide Biomedical Waste
  Collection, Treatment and Disposal System
  GENERAL AND TECHNICAL DATA"

The Bidder's identification shall not be shown on the outside of the sealed envelope and package but shall be enclosed in an unmarked envelope attached to the exterior of the proposal documents.

The proposal documents shall be delivered by the Bidder and received no later than 2:00 PM (P.D.T.) on August 28, 1990 at the following address:

B.C. Purchasing Commission
4000 Seymour Place
Victoria, B.C.
Canada
V8X 4Y3

Each set of proposal documents will be marked on receipt by the designated representative of the B.C. Purchasing Commission to show the date and time received. A corresponding numbered list with dates and times proposals are received, will be maintained.

2.20 Opening of Proposals

The unmarked envelope attached to each set of proposal documents shall be opened starting at the proposal closing time and the Bidder's name or names announced and recorded against the proposal number marked at the time of receiving the proposal.

The remaining sealed proposal documents will be forwarded to BWSPC Co-Chairmen for distribution. Bidders' deposits will be retained and managed by the B.C. Purchasing Commission.

2.21 Processing of Proposals

In addition to the "FINANCIAL DATA", one set of the "GENERAL AND TECHNICAL DATA" for each proposal will be forwarded for evaluation to a designated engineer. The evaluation criteria outlined under Section 2.22 of this RFP will be employed as the basis for recommending along with explanations to the Province and GVRD those proposals and Bidders warranting more extensive evaluation and possibly negotiations. It is estimated that this preliminary stage of evaluation will require about 30 days and the subsequent review and confirmation or revision by the Province and GVRD an additional 15 days. The proposal deposit will be returned on completion of the preliminary evaluation, to all Bidders except those whose proposals are to receive further evaluation.

The final stages of evaluation will require a detailed assesment of all aspects of each proposal selected after preliminary evaluation. Visits to existing operating installations of similar scope for which the Bidders were responsible, are expected to be necessary to assess the validity of proposal data provided and to assist in the evaluation process. On receipt of the evaluation report from the designated engineer, the Province and GVRD may excercise their right to enter into detailed negotiations with one or more of the Bidders mainly on matters of clarification which however may alter the original proposal. The Province and GVRD shall be the sole judge with whom they negotiate and shall not be subject to claim or other action by any Bidder not requested by the Province and GVRD to enter into negotiations. During negotiations the terms and conditions pertaining to a potential Contract will be defined.

The objective of this process is to select a Bidder with whom the the Contracting Agency desires to enter into a contract for a Province-Wide Biomedical Waste Collection, Treatment and Disposal System under the proposed conditions or a negotiated and agreed modification. If this does not result in a contract award, confirmed by a qualified Letter of Intent subject to successful completion of the approvals process, the Province and GVRD may select another Bidder and if this does not result in a confirmed contract award, BWSPC may repeat the selection process until a contract award is confirmed. The Province and GVRD, however, reserve the right to reject any or all proposals without stated reason. Each Bidder who submits a proposal in response to this RFP does so with the clear understanding that the Province and GVRD accept no liability for damages of any kind arising from failure to select the Bidder's proposal or any proposal for award.

2.22 Evaluation Factors

2.22.01 General

Proposals must provide a clear complete description of the proposed Biomedical Waste Collection, Treatment and Disposal System and its components including the various related subjects outlined in this RFP to qualify for further evaluation. Those which comply will be evaluated by assessing the Bidder's proposal in terms of the factors below:

2.22.02 Capability

- Evidence of technological capability based on proven performance of systems and system components similar to those offered, to handle the province-wide and regional collection, transportation, treatment and disposal of biomedical waste.
- Qualifications and experience of the Bidder and his key personnel or associates to carry out or manage competent design, permitting, supply, start-up, testing, approvals and all related requirements to provide a successful completed operating system.
- Qualifications and experience of key personnel of the Bidder and associates to select and provide competent operations management, to select, acquire and train operating personnel and to administer the successful operation of the system including performance, maintainance and cost control.
- Capability of the Bidder to provide Performance Bond, Operations Bond, Insurance and Workman's Compensation as may be required.
- The extent of financial guarantees that the system will be complete and in operation on schedule at the agreed rate schedule and free of liens or other encumbrances which could translate into increased costs to hospitals, provincial agencies or others dependant on the system for waste disposal.
- Financial resources and projected long term capability and commitment of the Bidder to correct system deficiencies promptly if they occur, to provide alternative collection and disposal during outages or emergencies and to continue operations for at least 10 years on the price basis quoted.
- The degree of independence of biomedical transportation, treatment or disposal including residues outside the Province of British Columbia even under the most severe emergency conditions, is an important consideration in evaluating proposals.
- The qualifications and experience of the Bidder and his key personnel or associates to organize and carry out an effective program of public participation and consultation and to adapt the overall biomedical waste system in a manner which will accomplish maximum public support, is also very important.

2.22.03 Environment

- Compliance with applicable regulations and guidelines.
- Potential for waste spillage from vehicles or containers.
- Emissions to the atmosphere or in-plant.
- Effluents and their disposal.
- Solid residues and their disposal.
- Site sizes, locations, acquisition status and related considerations or constraints.
- Potential traffic effects.
- Program for biomedical waste packaging, handling and containment.
- Public health and safety risk assessment.
- Public acceptability.
- Employee health and safety provisions.
- Visual impact of facilities and sites.
- Organization and program to obtain approvals.
- Organization and program for public consultation.

2.22.04 Technical

- Schedule for approval process after potential selection and receipt of qualified Letter of Intent.
- Schedule for start-up of biomedical waste collection, treatment and disposal and for progress toward a fully operational province-wide system.
- Review of proposed collection vehicles including age, type, size, number and collection schedule, maintenance and storage facilities, treatment and disposal facilities, vehicle offloading, waste handling and storage, treatment process, and controls, air emission controls and monitoring, effluent collection, treatment, controls, monitoring and disposal, solid residue collection, controls, monitoring, containment and disposal, employee locker room facilities, general building service requirements, site access, vehicle unloading, vehicle storage, vehicle access to site and all additional design considerations.
- Historical operating experience for each major system component.
- Minimum waste load requirement and maximum capability.

- Flexibility to handle changing quantities or characteristics of waste.
- Reliability and performance as demonstrated by full scale operations.
- Operational complexity and sensitivity.
- Provisions for component failure or malfunction, for example waste refrigeration system.
- Energy and utiliy requirements.
- Assured use for recovered energy if any.

2.22.05 Economic/Financial

- Prices quoted for collection and delivery of biomedical waste and for treatment and disposal using one or more facilities.
- Basis proposed for escalating rate schedules.
- Estimated costs and program for the approval process, land acquisition, equipment and facilities, operations, maintenance, management and financing on which the prices quoted were based.
- Prices for acquisition of ownership of the waste treatment facilities by the Public, 5 years after start-up and 10 years after start-up.
- Charges for the Contractor to continue operations, maintenance and management of the treatment facilities including disposal of residues for 5 years if public ownership is acquired after 5 years.
- Source, amount and reliability of revenue expected from recovered energy.
- Availability of grants or other financial assistance and amounts assumed in the proposal.
- Compensation policy for failures to collect and dispose of biomedical waste.
- Private and public sector roles.
- Contribution of the project to provincial employment and taxes.
- Canadian and local content.
- Federal and Provincial taxes included in cost estimates.

2.22.06 Operations

- Proposed staffing and management structure and program.
- Training program.
- Safety considerations.
- Maintenance facilities and program.
- Contingency plans.

3 FORM OF PROPOSAL

3.01 General

Bidders whose proposals will not suit the format below due to alternate system format, shared ownership or other aspects of the proposal must develop and present the basis for payment to suit the proposal requirements keeping as close as possible to the format outlined below.

3.02 Schedule of Rates for Biomedical Waste From Hospitals

The schedule of rates is to be for the initial year of operation (tentatively 1993) and will be subject to an annual increment based on the CPI and other indices if appropriate. The Bidder is to state the basis for rate escalation proposed in his submission. Requests for rate changes by the Contracting Agency or by the Contractor will be subject to negotiation. Disagreements between the Contractor and the Contracting Agency which cannot be resolved within a specified time, will be subject to arbitration. Daily waste quantities will be averaged over each calender month period. The weight of disposable containers shall be included in the weight of biomedical waste.

The rates shall be uniform throughout the province-wide system and shall be stated separately for collection and transportation of waste to the treatment facilities and for the treatment and disposal of waste.

The rates shall be stated for the minimum committed average of 10,000 Kg/day of biomedical waste from hospitals and the reduction in rate shall be stated for each 10 percent increase in the average daily quantity up to the system capacity.
The total charge for the minimum committed waste quantity will apply if less then that amount is made available for collection during a calender month. The rate charged per kilogram will be increased for that month as required to provide the minimum total charge.

When feasible the quantity of biomedical waste collected from each hospital may be established by weighing the vehicle before and after loading. Where waste from more than one hospital is collected in one load, each carton of biomedical waste will be weighed after unloading and allocated to the individual hospitals in accordance with identification on the package of its source of origin.

3.03 Rates for Other Biomedical Waste

Biomedical waste is generated by sources in British Columbia other than publicly funded hospitals and health care facilities. Since a reliable estimate of the quantities and types of such biomedical waste and the locations related to the quantities cannot be provided at this time, the Bidder is requested to describe how he proposes to handle the collection, treatment and disposal of the portion of this waste he may be asked to receive. The Bidder is also requested to state his estimate of the rates he would charge in each region for collection and for treatment and disposal and the criteria on which these rates are based including details of capital and operating costs for collection, storage and transfer facilities.

3.04 Rates for Collection and Disposal of Non-Biomedical Waste

Bidders who are including and describing fully in their proposals, alternative collection and disposal systems which incorporate non-biomedical waste such as total hospital solid waste (excluding kitchen and office waste), other special waste or municipal solid waste, shall include a rate schedule for collection and transportation and treatment and disposal of such waste. In addition, a rate schedule similar to that described under Section 3.02 for biomedical waste is required showing the reduction in rates arising from collection and disposal of additional non-biomedical waste.

3.05 Agreement to Bond

Each Bidder must establish in his proposal his capability of executing a Performance Bond in the amount of $2.5 million to ensure completion of an operating system and may be

required to complete an Agreement to Bond before his proposal is selected for final negotiation prior to a possible Contract Agreement. After completion and acceptance of the system, an Operating Bond of $2.5 million will be required. The Bonds are to provide a financial guarantee of completion and operation of the province-wide system on schedule and to protect the Contracting Agency from liens or other obligations arising from failure of the Contractor.

3.06 Insurance Policies and Certificates

Each Bidder must declare in his proposal, his capability and willingness to provide appropriate insurance and Worker's Compensation coverage in the event that his proposal is accepted.

3.07 Financial Capability

Each Bidder shall provide with the tender sufficient reliable evidence of the Bidder's financial ability and willingness to provide and warrant the Province-Wide Biomedical Waste Collection, Treatment and Disposal System and Service offered in his proposal, to receive consideration of the proposal by the Province and GVRD and their designated Engineer. Recent audited financial statements and examples of existing contracts for a similar service would contribute to this assessment.

3.08 Corporate/Joint Ventures Structure

Each Proposal submitted by a Joint Venture or Consortium must provide a clear description of the individual members and their separate capabilities similar to those required for individual corporate Bidders.

3.09 Bidder's Experience

Provide data giving a clear picture of the Bidder's experience and that of each member of a Joint Venture or Consortium relating to each component of the proposed Province-Wide Biomedical Waste System and also to similar overall systems. These data should include for each example:

- name and location of waste processing operation
- description of facility and operation
- capacity and average biomedical waste throughput
- date of initial operation
- history of environmental performance
- compliance with permit requirements and any penalties for non-compliance
- capital and operating costs
- rates charged for biomedical waste collection
- rates charged for biomedical waste treatment and disposal

3.10 Bidder's Qualifications

Provide description of the Bidder's corporate qualifications including:

- description of the scope of Bidder's corporate activities and size of organization;
- capabilities and experience of key personnel related to the proposed waste management system;
- Bidder's facilities and equipment related to the requirements of the Biomedical Waste System.

3.11 Staff Commitment

The proposal must state the names and capabilities of personnel who will be assigned by the Bidder to the project in the event that the Bidder's proposal is selected for award of contract.

3.12 Sub-Contractors and Major Suppliers

List names and addresses of Sub-Contractors and major suppliers included in the proposal along with the extent of supply, installation and/or operation to be provided by each and his related experience.

3.13 Canadian and Local Content

Each proposal is to contain the maximum feasible Canadian and local content and Bidders are requested to provide realistic estimates of the percent of Canadian and of local costs in the total cost for major components of the proposed Biomedical Waste System. Location of the entire system including residue disposal within British Columbia will be a positive evaluation factor.

3.14 Proposed Schedule

Show in tabular or graphic form the schedule which the Bidder will commit to adhere to in implementing the proposed Province-Wide Biomedical Waste System. The schedule should state or show all information required to assess the proposed performance including the following milestones:

- starting date - Agreement and Letter of Intent
- environmental approval for system sites and facilities
- contract award
- start of erection of Treatment & Disposal Facilities
- initial operation dates for regional collection systems
- 50%, 90% and 100% of total Facility capacity

3.15 Federal Tax Allowances and Exemptions

The proposal is to clearly state what Federal Tax exemptions have been assumed, what the bases for the claimed exemptions are, what reduction in net cost has resulted from the assumptions, what claims for refund are included in the assumed exemptions and whether the refund amounts have been deducted in arriving at the prices quoted. If allowances for expected changes in the Federal Tax have been included in the costs and rates quoted, state the amounts allowed. If no allowances have been included, state the estimated change in costs and rates which the expected changes in the Federal Tax will cause.

3.16 British Columbia Sales Tax

The proposal is to include British Columbia Sales Tax to the extent that the tax is applicable.

4 SOURCES AND QUANTITY OF BIOMEDICAL WASTE

4.01 Definition of Biomedical Waste

"Biomedical Waste" means waste that is generated by

a) human health care facilities, medical research and medical teaching establishments or clinical laboratories;

b) animal research establishments the activities of which are related to human health and which expose animals to cultured, live or attenuated microorganisms or vaccines, pharmaceuticals, or expose animals to substances for toxicity testing purposes;

and includes but is not limited to:

ANATOMICAL WASTE

(1) Human Anatomical Waste

Consisting of human tissues, organ and body parts but excluding teeth, hair, and nails.

(2) Animal Anatomical Waste

Consisting of animal tissues, organs, body parts and carcasses, excluding teeth, hair, nails, wool, feathers, and hooves, from healthy animals.

NONANATOMICAL WASTE

(3) Microbiology Laboratory Waste

Consisting of laboratory cultures or stocks of microorganisms, live or attenuated vaccines, human or animal cells and laboratory material that has come into contact with the above.

(4) Waste Sharps

Clinical and laboratory materials consisting of needles, syringes, blades, or other items capable of causing cuts or punctures.

(5) Blood and Body Fluid Waste

Consisting of fluid blood and blood products, items saturated and/or dripping with blood, and body fluids, of either human or animal origin.

(6) Special Precaution Waste

Consisting of waste from human patients identified as having diseases requiring special precautions as specified in the Health and Welfare Canada publication "Infection Control Guidelines".

(7) Animal Bedding Waste

Consisting of the bedding of animals that have been exposed to diseases highly communicable to humans.

but does not include:

(a) waste from animal husbandry and animal health care facilities;

(b) waste generated from in-home human health care;

(c) waste that is controlled in accordance with the Animal Disease and Protection Act (Canada);

(d) waste from food production, general building maintenance, and office administration of human or animal health care facilities; and

(e) general ward waste not included above such as soiled dressings, sponges, surgery drapes, casts, catheters, disposable gloves, lab coats, and disposable sheets.

This definition does not apply to nonanatomical waste listed above provided that this waste has been disinfected or decontaminated.

4.02 Biomedical Waste Generated by Hospitals in British Columbia

The principal generators of biomedical waste are hospitals. Based on the 1988 Task Force survey of hospitals in B.C., the rate of biomedical waste generated averaged 0.78 Kg/bed/day. This compares with an average of 0.50 Kg/bed/day Canadian and United States literature. To avoid underestimating the potential quantity of biomedical waste in the province requiring treatment, the higher figure of 0.78 Kg/bed/day has been used in this RFP to estimate the current maximum. Based on a total of 20856 hospital beds province-wide in 1990, the corresponding total generation rate of biomedical waste by hospitals in B.C. averages from a minimum estimate of about 10,000 Kg per day up to a maximum estimate of 16,000 Kg per day. If it is assumed that this value could increase almost 15%

over the next ten years, the maximum estimated for the year 2000 could reach about 18,000 Kg per day based on projections in Appendix G.

4.03 Estimated Maximum and Minimum Hospital Biomedical Waste by Region

The estimated total biomedical waste generated by hospitals has been divided by region according to the approximate numbers of hospital beds in 1989. The estimated portion of the minimum total quantity of biomedical waste which is expected to be generated in each region expressed as daily averages based on monthly totals, is tabulated below:

REGION	APPROX. NUMBER OF BEDS*	MAXIMUM WASTE QUANTITY GENERATED EST. KG/DAY**	MINIMUM WASTE QUANTITY GENERATED EST. KG/DAY***
1 Lower Mainland	10900	8500	5400
2 Vancouver Island	4200	3300	2100
3 Interior	2600	2050	1300
4 Kootenay	1000	800	500
5 Northern	1100	850	550
6 Skeena	500	400	250
Totals	19800	15900	10100

* acute and extended care beds

** based on an average generation rate of 0.78 Kg/bed/day

*** based on an average generation rate of 0.50 Kg/bed/day

4.04 Locations, Sizes and Types of Hospitals in B.C.

The names of hospitals throughout B.C. are listed in Appendix A with the number of beds and types of care provided in each, based on statistics for 1989 and 1990 supplied by the Ministry of Health. The maximum total average daily rate of biomedical waste generation

by the hospitals is estimated on the basis of 0.78 Kg per bed per day and the minimum total on the basis of 0.50 Kg/bed/day. The locations of the hospitals are listed in the Hospital Directory in Appendix B. The map in Appendix D shows the various hospital locations divided into six regions which apply to the proposed Biomedical Waste Collection, Treatment and Disposal System. Additional data which will help clarify the sizes and locations of hospitals in the GVRD is provided in Appendix E. The populations of various communities in British Columbia are listed in Appendix G along with population trends and hospital bed demand projections.

4.05 Other Sources of Biomedical Waste

4.05.01 Veterinary Clinics and Hospitals

Based on the current definition of Biomedical Waste in Section 4.01 waste from veterinary clinics and hospitals is not included within the scope of this RFP. However, the Contractor may find it worthwhile to include the capability of handling this waste.

4.05.02 University Animal Care Facilities and Research Laboratories

The data from these sources is not broken down. Approximately 6000 kg/month total waste is generated from these sources in the GVRD alone. It is assumed that biomedical waste which requires treatment may represent 100 to 200 kg per day province-wide.

4.05.03 Canadian Red Cross Blood Transfusion Center

The Vancouver Center generates 8000 litres of liquid biomedical waste per month and 4000 kg of solid biomedical waste per month. All waste is specially packaged to standards developed by the Red Cross.

4.05.04 Medical and Other Health Laboratories

The preliminary study by Environment Canada in 1984 suggested that medical and other health laboratories generate an average of 6.5 kg/month/employee of biomedical waste. Data is not available at this time to estimate the total from private and diagnostic laboratories or from general physicians and dentists. The amount of biomedical waste from

these sources should not significantly increase the total generated but could involve a different disposal fee basis.

4.06 Estimated Quantity of Biomedical Waste in British Columbia

Adding the estimated quantities of biomedical wastes requiring treatment from various sources in British Columbia gives a current total averaging about 17000 kg/day not including separately packaged liquid biomedical waste generated by the Canadian Red Cross Blood Transfusion Centre or waste from SPCA Animal Shelters which could be classed as biomedical. Based on an increase of roughly 15% over 10 years from the population trend data, it has been assumed that the growth in biomedical waste generation for the province could be in the order of 1 to 2% per year over the next 10 years. On this basis, the maximum total biomedical waste generated in British Columbia could reach an average of 20000 Kg/day by the year 2000. The Biomedical Waste Collection, Treatment and Disposal System must be capable of consistently processing this waste quantity with ample allowance and provision for outages and temporary surges in supply.

4.07 Other Health Care Solid Waste

Interest has been expressed by hospitals in the GVRHD in having their entire health care solid waste (HCSW) stream collected, treated in a central incineration facility and the residues disposed of appropriately. If half the hospitals in the Lower Mainland Region alone were included in the total waste input to an alternate central facility designed to handle this HCSW, the waste input to the facility would be increased by about 25,000 to 35,000 Kg/day. This is based on the total HCSW averaging roughly 8-9 times the estimated biomedical waste assuming 0.5 - 0.78 Kg/bed/day.

4.08 Proposed Packaging of Biomedical Waste

The Task Force has recommended that B.C. adopt the CSA Standards "Handling of Waste Materials Within Health Care Facilities" (CSA 1988) on an interim basis with minor modifications for the segregation, labelling, and packaging of biomedical wastes. It has further recommended that no compaction of packaged solid untreated biomedical waste destined for off-site treatment or disposal, be carried out. A Code of Practice for the Management of Biomedical Waste in Canada drafted by the CSA for the CCME is currently under review and will establish minimum packaging requirements for handling of biomedical waste for shipment from Health Care facilities. The Transportation of Dangerous Goods Act lays out current legal requirements for packaging certain biomedical waste. Bidders are to base their proposals on existing CSA Standards and federal regulations and may suggest alternate or supplementary packaging where this would facilitate safe effective collection, transportation, treatment and disposal at the proposed Central Facility(ies). The Contractor selected will be expected to work with hospitals, other biomedical waste generators, the B.C. Ministry of Environment and the Contracting Agency to facilitate implementation of optimum packaging practices.

5 COLLECTION AND TRANSPORTATION OF BIOMEDICAL WASTE

5.01 General

The Bidder is to include a description of the Collection and Transportation System which he proposes to provide and operate in sufficient detail to permit a thorough assessment of the feasibility, completeness, flexibility, safety, provision for emergencies, cost to waste generators, and his competence and experience in providing and operating similar systems.

5.02 Regulations and Guidelines

The biomedical waste packaging, handling, transportation vehicles, transportation containers, refrigeration, intermediate storage, transfer facilities and all components of the Collection and Transportation System must comply with all regulations and guidelines applicable in British Columbia including:

- Transportation of Dangerous Goods Act and Regulations, Transport Canada.
- Guidelines to be prepared by the B.C. Ministry of Environment based on the draft Code of Practice for the Management of Biomedical Waste in Canada being prepared by Canadian Standards Association for the CCME.
- B.C. Reg. 63/88 Special Waste Regulation (April 1, 1988) under the Waste Management Act.

5.03 Transport by Roads and Highways

The facilities, vehicles, trailers, refrigeration, insulation and other features included in the Biomedical Waste Collection System in addition to meeting all applicable regulations and guidelines and the objectives listed below, shall be described in sufficient detail to allow a complete assessment of the proposed system:

- packaging and containment of solid waste that will minimize the potential hazards from contact with the waste during and after an accident on route.

- monitoring waste during loading to eliminate leaking or otherwise defective packaging and to detect and reject radioactive materials.
- provide and distribute manifests which record waste received and inform appropriate authorities.
- containment, refrigeration and insulation that will minimize the possibility of thawing of frozen waste before vehicle repair or transfer to another suitable vehicle.
- integral, rugged radio communication equipment and system which will permit prompt notification of appropriate personnel of any abnormal circumstance.
- design of the vehicle or trailer to permit safe thorough cleaning and disinfection after each delivery of biomedical waste.
- spare vehicles, tractors and refrigerated trailers to provide for provision of service during repairs and maintenance and to provide for temporary refrigerated storage during outages to supplement fixed refrigerated storage facilities.
- where the Bidder can guarantee a consistent time interval of less than four days between generation of biomedical waste and incineration or other appropriate treatment and disposal method for specific hospitals, he can consider the use of non-refrigerated vehicles for collection and transportation of this waste under appropriate ambient conditions. The reduction in costs and the related effect on fee structure must be stated. A Bidder who incorporates waste transportation in non-refrigerated vehicles will be expected to absorb all costs should refrigeration subsequently prove necessary.

5.04 Biomedical Waste Storage and Transfer Stations

In view of potentially large transport distances (in the event of a centralized treatment system) and the relatively small biomedical waste quantities generated in the rural areas of British Columbia, the Bidder may decide to offer Biomedical Waste Storage and Transfer Stations as components of the Collection System. These may not only be useful in transferring from smaller local collection vehicles to large highway trailers, but also in transferring to refrigerated containers for rail transport, ship transport and possibly even air transport if restrictions and regulations permit. Such transfer stations shall be be described

in sufficient detail to allow a complete assessment of proposed facilities which comply with all applications and guidelines and the objectives listed below:

- the transfer stations shall be designed and operated to minimize potential hazards which could arise from handling and storage of biomedical waste.
- the biomedical waste transfer and storage operations shall not be incorporated in a facility also handling municipal solid waste or other waste unless the biomedical waste handling and storage section is completely separated and is provided with all the appropriate facilities to minimize potential hazards.
- the transfer station shall include ample refrigerated storage with sufficient insulation, emergency power and other provisions to maintain biomedical waste frozen during abnormal conditions.
- the transfer station shall include locker and washroom facilities appropriate to a biomedical waste handling facility.
- the transfer station design and facilities shall provide for thorough cleaning and disinfection of all potentially contaminated areas and equipment and shall have suitable procedures for disposal of washings specified in the Proposal.
- each proposed transfer station shall be fully described including biomedical waste handling capacity, refrigerated storage, location, appearance, operating personnel etc. The appearance must create a positive public impression.
- areas requiring transfer stations shall be identified together with all costs associated with siting, zoning, land purchase, public participation meetings, approvals, permits, capital costs, operating costs and maintenance costs.

5.05 Transport by Rail

Bidders may decide that transport of biomedical waste by rail from remote rural areas to a Central Treatment and Disposal Facility is preferrable to truck transport by highway especially in Winter. This may also apply to transport to separate Regional Treatment and Disposal Facilities located closer to remote rural areas. If so, the Bidder must completely describe all aspects of the proposed use of rail transport including but not limited to sources and quantities of waste involved, transportation to rail loading points, shipping

containers proposed, loading and temporary storage of containers, maintaining refrigerated conditions on route, emergency provisions, transfer from rail delivery to the Central Treatment Facility(s) and compliance with all applicable regulations and guidelines related to this transportation system.

5.06 Transport by Ship

Bidders may decide upon transport of biomedical waste by water from areas near the coast or located on islands to a Central Treatment and Disposal Facility. If so information parallel to that requested above for rail transport is to be provided.

5.07 Transport by Air

For the relatively small quantities of biomedical waste generated at some remote rural facilities located near airports, Bidders may wish to consider air transport as part of the transfer to a Central Treatment and Disposal Facility. The container design and other requirements for safe air transport of biomedical waste have not been defined. Bidders must describe how they plan to provide safe air transportation.

5.08 Performance Testing

After the Biomedical Waste Collection, Treatment and Disposal System is fully functional, the performance of the Collection and Transportation System will be monitored for one summer month and one winter month to make certain that the requirements of the Contract terms and conditions have been met and that the needs of the biomedical waste generators have been satisfied. Performance will continue to be monitored by regular review of records and reports to ensure that satisfactory service is maintained.

6 METHODS OF TREATMENT AND DISPOSAL OF BIOMEDICAL WASTE

6.01 General

Controlled incineration under designated conditions is applicable as a disposal technology to most solid biomedical wastes and some liquid biomedical wastes. The organic components are changed to sterile non-combustible gases which are greatly reduced in weight and volume, and the remaining solids are rendered non-infectious. Proven incineration technology which meets all applicable environmental regulations and guidelines is the primary process for treatment and disposal of biomedical waste in this RFP.

Alternative treatment methods which sterilize or disinfect the waste are non-destructive and require matching disposal arrangements. These methods include:

- Sterilization by steam (autoclave)
- Sterilization by dry heat
- Disinfection by physical/chemical treatment
- Sterilization by chemical vapour
- Various other technologies.

Bidders may elect to offer one or more alternative treatment technologies proven in full scale operation for part of the biomedical waste stream. The residues must contain no anatomical waste, must comply with all disposal regulations and guidelines, must be effectively monitored and disposal arrangements specifically described.

6.02 Incineration of Biomedical Waste

A properly designed and operated biomedical waste incinerator can ensure complete burning of the combustibles and destruction of infectious microorganisms by exposing the waste and the gaseous products of combustion to sufficiently high temperatures for long periods of time.

In order to process a wide range of biomedical waste, the incinerator design and operation must accommodate a wide range of waste compositions, heating values, and moisture contents including free liquids in plastic packaging. The feeding mechanism and hearth must prevent leakage of infectious liquids and the feeding mechanism design should facilitate periodic disinfection and cleaning.

The relatively high proportion of polyvinyl chloride (PVC) in biomedical waste results in higher concentrations of hydrogen chloride in the combustion gases than results during incineration of municipal waste. This can result in significant corrosion damage to the equipment unless appropriate care is taken in process design, materials of construction, appropriate operating procedures, and effective process control. The hydrogen chloride emissions, as well as suspended particulate and suspended heavy metals, may exceed the levels permitted under the regulations and guidelines of the B.C. Ministry of Environment unless suitable measures for cooling and cleaning gases from combustion are provided in the incineration system. The disposal of effluents and residues from the gas cleaning system must also comply with applicable sewage and landfill requirements, or have other means of disposal available. Dioxin and furan emissions below accepted guidelines can be assured by staged combustion systems which provide retention of at least one second at a temperature of above 1000°C after at least 50% excess combustion air has been mixed into the combustion gases. Gas cleaning systems can further reduce these emissions. The incineration system should be designed to avoid leakage of combustion gases from the equipment into the building housing the system and be provided with a safe means of venting such gases as may be required during system upset.

The fly ash which separates from the combustion gases after the secondary chamber, in heat recovery, gas cooling or gas cleaning equipment, has been sterilized by the above temperature and retention. The disposal requirements will mainly depend on the quantities and leachability of heavy metals which may be present. The solid residues or bottom ash from the combustion chamber must be subjected to sufficient heat to maintain an adequate temperature for a long enough period before discharge to ensure that the ash has been

decontaminated and is virtually free of organic carbon compounds. The specific time and temperature required to achieve acceptable bottom ash criteria will depend on the incinerator design, whether operation is on a batch or continuous basis and the degree of mixing and exposure of all parts of the ash bed to the furnace temperature. Operation under excess air combustion conditions at temperatures above 760°C (1336°F) is considered essential in the ash burnout cycle or burner section of the ash bed to achieve destruction of organic matter and pathogens. Regular sampling and testing will be a necessary part of operations.

A heat recovery boiler may be used to cool the gases from the incinerator before cleaning and discharge to atmosphere. Design and operation of such a unit must minimize corrosion, need for frequent manual tube cleaning, maintenance requirements, and other causes of significant system downtime. Moreover, a suitable energy user must be reasonably close by. In any event, the maximum inlet gas temperature to most gas cleaning systems requires that the means of cooling and cleaning the hot incinerator gases receives careful consideration to select a practical working design. The air emission criteria to be met are described in the draft B.C. Ministry of Environment Emission Objectives for Biomedical Waste Incinerators.

The capacity of the central incinerator system required will depend on the capacities of other regional treatment systems and alternative treatment systems which the Bidder is offering in the proposed Province-Wide Treatment and Disposal System. Capacity must also allow for the turndown capability of the process, the utilization factor and allowance for outages, and the allowance for further increase in throughput. A central facility with two independent incineration systems each capable of processing about two-thirds of the required total throughput, would be preferred to achieve high reliability. Proposals which do not rely on export of waste or residues to disposal facilities outside the province, even during emergencies, will be favoured.

The above outlines some of the major factors which will be assessed if incineration is offered as one of the disposal methods. Sufficient details about the proposed system

design and operation are requested to permit an effective preliminary assessment. Additional factors related to the Central Facility are outlined in Section 7.

6.03 Incineration of Total Hospital Solid Waste

The cost of effective disposal of biomedical waste is much higher per unit weight than the cost for disposal of non-infectious solid waste. Nevertheless, some forward-looking hospital executives believe that incineration of all hospital biomedical waste and non-infectious health care solid waste (HCSW) is the only way to guard against errors in waste segregation with the potential related problems of negative public reaction and even legal ramifications. In addition, the relatively high average heat content of the non-infectious waste can contribute to the incinerator heat input required to effectively process the biomedical waste which tends to have a higher moisture content. Deleting hospital kitchen waste which can be readily segregated, has a relatively high moisture content, and could be readily landfilled or recycled through composting processes, improves the average heat content of the waste stream. Waste from hospital administration offices can also be recycled or handled by other normal municipal waste disposal methods.

The quantity of HCSW which could be available to a Central Biomedical Waste Treatment and Disposal Facility has not been established at this time. Since regulations requiring special treatment of HCSW have not been established, no minimum quantity of HCSW can be guaranteed to a Contractor offering such service except by agreement with hospitals. Depending on collection and disposal costs involved, there could be a substantial quantity offered in the more densely populated regions.

If a total input of hospital waste of about 45 tonnes/day to an incineration facility is assumed with an average higher heat content of roughly 3590 kJ/kg (7500 Btu/lb), a heat recovery system could generate about 6,300 Kg/hr (13,800 lbs/hr) of saleable or usable steam. Except for normal outages, the steam would be generated seven days per week and for effective utilization, would require a customer with a consistently high steam demand. Combining the waste disposal facility with a hospital laundry and linen service might

provide an appropriate steam use. The steam can also be converted to electrical energy for which there is a large market but the increased capital cost and relatively small revenue may make this an unattractive choice.

In addition to the scope described in the RFP for a Province-Wide Biomedical Waste Collection and Disposal System, this alternative would add the requirements for collecting and disposing of all solid waste generated by hospitals with the possible exception of waste from hospital kitchens and administrative offices. The collection vehicles, containers, and storage facilities for the additional non-biomedical solid waste can resemble those suitable for municipal solid waste. The incineration facilities must have the special features required to process biomedical waste and cannot be of normal municipal waste design unless the biomedical waste has been decontaminated before receipt at the facility. The "Operating and Emission Guidelines for Municipal Solid Waste Incinerators" issued in October 1988 by the Canadian Council of Resource and Environment Ministers, could assist in defining the basic incineration criteria.

Although the prime objective of this RFP is biomedical waste disposal, the Province and GVRD are interested in the relative merits of total HCSW disposal. A general outline of the waste collection system and the central treatment and disposal facility along with a suggested suitable site, specific interested energy user(s) and the proponent's experience in similar successful applications is requested if the Bidder is interested in this alternative approach. In addition, preliminary estimates of waste collection and treatment/disposal costs will assist in assessing the feasibility of this alternative approach to waste disposal and the proponents' capability of providing and operating such a system.

6.04 Incineration of Other Waste

Incineration of biomedical waste with municipal solid waste (MSW) or selected special waste with or without additional non-biomedical HCSW, may offer potential economies of scale and shared disposal cost. Each waste can also provide supplementary heat input which may reduce fossil fuel consumption in the incineration of the biomedical waste.

If the incineration and gas cleaning systems are capable of meeting all combustion and environmental requirements for biomedical waste, the requirements for MSW and HCSW will likely be exceeded. The requirements for collection, transport, unloading, storage and incineration of hazardous waste will depend on the specific waste involved. If a Bidder makes a proposal based on co-incineration of other waste it is essential that a Bidder offering such an alternative clearly and completely defines all aspects of the proposed system along with waste sources, types and quantities.

6.05 Steam Sterilization by Autoclave

Steam sterilization refers to the destruction of bacterial and infectious organisms using steam. Normally, this takes place in a sealed pressure vessel called an autoclave using steam under pressure. This process has been widely used over many years in sizes ranging from small laboratory units to large hospital autoclaves. A source of steam at appropriate pressure is required.

Decontamination in an autoclave is achieved primarily through steam penetration and standardized operating practice is essential to promote effective sterilization. In particular, low density wastes such as plastics, are the most amenable to this treatment and small loads help ensure uniform temperatures being maintained. Containers for the waste must permit good steam circulation and if plastic bags are used, they should preferrably be heat-resistant and placed inside a second rigid container to avoid spillage.

In addition to anatomical waste, autoclaving is not suitable for multiple hazard materials including radioactives, antineoplastics, and toxic or volatile chemicals. The efficiency of the treatment is monitored regularly using biological indicators with Bacillus stearothermophilus being most often recommended.

If steam sterilization is offered as a component of the Biomedical Waste Treatment and Disposal System, the Bidder is asked to describe the autoclave proposed, the quantity and

types of waste to be sterilized, the method of segregating these at source, the operating conditions and controls, emission, monitoring, source of steam, experience with the technology and operation, proposed method of handling and disposal of autoclave residues and treatment and disposal proposed for biomedical waste unsuitable for autoclave treatment, in sufficient detail to permit an effective assessment of the proposal.

6.06 Sterilization by Dry Heat

Treatment methods using heat transfer are usually applied to large volumes of liquid or solid biomedical waste. Liquids are heated in either a batch or continuous mode to maintain sterilization temperatures for a set time and often require cooling to meet prevailing discharge requirements. Similar precautions as taken with steam sterilization are necessary to ensure efficient treatment. Mixing may be added for uniform heat transfer. Solids are heated in ovens (usually electrically powered) and temperatures of 320 - 338°F are typically maintained for 2-4 hours. The extensive time and energy requirements often preclude common use of dry heat inactivation of solid wastes. Spores of Bacillus sublilis (niger globigii) are often recommended as the monitoring indicator.

If dry heat sterilization is offered as a component of the Biomedical Waste Treatment and Disposal System, sufficient data is requested for assessment of the proposal.

6.07 Disinfection by Physical Chemical Treatment

The combination of chemical disinfection and hammermill pulverization is a process being tested and marketed. The chemical hammermill process can accept a wide range of biomedical waste material reducing it to fine particles which are contacted by a concentrated sodium hypochlorite solution. The solids are separated by settling in a weir tank and the carrier fluids normally discharged to sewer. The reduction of the waste to fine particles speeds the disinfection process and enhances uniformity of treatment. Continued monitoring will still be needed. This process is not appropriate for anatomical waste and cannot be applied to organic solvents. The chemical content of the resulting

waste liquid may restrict disposal to the sewer system. If the discharge is sufficient to cause problems either in the sanitary sewage collection system or at the sewage treatment plant or where there are contaminants of concern not specifically covered by the regional by-law, the applicable sewage control authority may specify limits as deemed necessary.

A pilot project using this treatment method is planned for Toronto with start up of a single line 1000 lbs/hour system in August, 1990. The effluent directed to the sewer will be filtered to meet strict requirements. The solid residue will also be closely monitored as criteria for "sterilized" residue is yet to be defined.

If the chemical hammermill or other physical treatment process is offered as a component of the proposed Biomedical Waste Treatment and Disposal System, sufficient related data on the equipment, operation, control, costs, and disposal arrangememts is requested for assessment.

6.08 Other Potential Treatment Methods

6.08.01 General Discussion

Several alternative potential methods of treatment or disposal of biomedical waste are briefly discussed below. These appear to be unproven on a large scale or for other reasons may be unsuitable for application to the proposed Treatment and Disposal System. If a Bidder offers one of these or another process not mentioned in this document as a component of the proposed system, sufficient related data are requested to permit a thorough assessment of the proposal.

6.08.02 Chemical Gas/Vapour

Sterilization by chemical gases or vapours commonly employs ethylene oxide or formaldehyde and is viewed as a specialized process not appropriate for general large scale use. The chemicals may be carcinogens and caution must be exercised to avoid the potential hazards associated with their use.

6.08.03 Plasma Arc

Gas becomes a plasma by electrical energization which produces a very high temperature up to 50,000°C. This process is capable of a very high degree of destruction in the absence of oxygen producing a solid residue or ash and gaseous emissions somewhat similar to those from incineration. This process is at the pilot scale stage and is expected to have very high operating energy costs.

6.08.04 Pyrolysis

Pyrolysis generally applies to thermal decomposition in the absence of air. A combustible gas is produced as well as residues containing carbon. Based on available information, it appears that the process has not yet been proven on a commercial scale for treating biomedical waste.

6.08.05 Microwave

Microwave sterilization is at an early stage of development, is currently the subject of a study in Quebec, and may initially be found appropriate for use in laboratories.

6.08.06 Gamma Irradiation

Atomic Energy of Canada Limited has developed commercial equipment using Cobalt 60 as energy source, with potential applications for biomedical waste treatment. Gamma rays can penetrate to a depth of several metres and are capable of treating all kinds of wastes with nominal power requirements and no residual heat. High capital cost, space requirement, and specialized operational needs are areas of concern. Ultimate disposal of the decayed radiation source is also problematical. The monitoring indicator recommended by approving jurisdictions is Bacillus pumilus spores.

7 BIOMEDICAL TREATMENT AND DISPOSAL SYSTEM

7.01 General

The Bidder is to include a description of the Biomedical Waste Treatment and Disposal System which he proposes to provide and operate in sufficient detail to permit a thorough assessment of the feasibility, completeness, safety, site(s), provision for emergencies, cost to generators, and his competence and experience in providing and operating similar systems. Although "site" and "facility" are used in the singular in this section, the proposed system may call for more than one of either and the requirements apply to each site and facility offered.

7.02 Description of Treatment and Disposal Facility

7.02.01 Site

The site considered optimum will be in an area suitably zoned and appropriate for the intended use. The site will be close to transportation networks and will provide delivery vehicles good access while avoiding routes that would disrupt residential or other sensitive areas. The required utilities and sewer connections will be available. The site size will be ample to allow optimum layout for efficient Facility operation without undue design restrictions and will allow space for future expansion, modifications or addition of new technologies. Space will be available for accommodation of delivery vehicles waiting to unload, for parking of employee vehicles, and for visitor parking. The site should be surrounded by a security fence and landscaped to provide a favourable visual impact upon the public.

7.02.02 The Treatment Facility

The facility is to include provision for receiving, weighing, and refrigerated storage of wastes, and treating of the wastes to minimize health hazards in their disposal. Provision will be made in terms of laboratory, equipment, operating procedures and controls to continually monitor the performance of the treatment system(s) and ensure consistent

elimination of infectious or hazardous content from the treated wastes. The provisions for operating personnel will be designed for maximum employee safety including locker, wash, change, and lunchrooms. The ventillation system will provide a clean air supply and will treat exhaust air as required before discharge, to eliminate odours or hazardous emissions. Noise levels inside and outside the Facility will be below objectionable levels. The Facility will include provisions for equipment maintenance, clean-up of accidental spills or breakages, delivery truck box washing and decontamination, fire protection, office space, and visitor gallery. The interior design and finishes will facilitate a hygienic environment and the exterior will provide a positive public impact.

7.03 Related Requirements

In order to construct the Facility, a suitably zoned site, and all applicable authorizations and permits must be acquired. These include authorization, permits, and/or contracts as appropriate for the disposal of expected solid residues, effluents, and emissions from the Facility. Arrangements for alternative disposal methods to be used in the event of lengthy outages should be in place. Arrangements for all the required utilities and services as well as road access are needed. Preliminary design of the Facility taking into account inputs from a public consultation process will be necessary before approval by the Ministry of Environment, GVRD and other authorities. The solid residues must meet all composition and leachate criteria applying to the landfill site selected. Effluents must comply with applicable regulations and guidelines and comply with the criteria which follow. Emissions must be pretreated to control toxic or odorous content and those from thermal treatment must comply with the criteria which follow.

7.04 Effluent Criteria for Special Waste Facilities *

Parameter	Maximum Concentration or Range [in (mg/l) unless otherwise specified]
Physical	
pH	6.5 TO 8.5
Temperature	32°C
Total suspended solids	20
Toxicity (Limit bioassay)	100% effluent
Inorganics	
Aluminum, dissolved	0.2
Ammonia, dissolved (expressed as nitrogen)	1.0
Antimony, dissolved	0.25
Arsenic, dissolved	0.1
Barium, dissolved	1.0
Boron, dissolved	10.0
Cadmium, dissolved	0.1
Chromium, dissolved (hexavalent)	0.1
Chromium, total	0.5
Cobalt, dissolved	0.1
Copper, dissolved	0.1
Cyanide (weak acid dissociable)	0.1
Fluoride, dissolved	15.0
Lead, dissolved	0.1
Manganese, dissolved	0.1
Mercury, total	0.001
Molybdenum, dissolved	0.5
Nickel, dissolved	0.5
Selenium, dissolved	0.05
Zinc, dissolved	0.2
Organics	
5 day Biochemical Oxygen Demand	20
Oil	10
Phenol	0.2
Polychlorinated biphenyls, total	0.005
Polychlorinated dibenzofurans	30 ng/l
Polychlorinated dibenzo-p-dioxins, total	30 ng/l
Total organic halogens	1.0

* Schedule 1 of B.C. Reg 63/88 Special Waste Regulation (April 1, 1988) under the Waste Management Act.

7.05 GVS&DD Sewer Use Bylaw Proposed Limits

Parameter	Proposed Discharge (1990) Limits (mg/L)	Existing GVS&DD (1971) Limits (mg/L)
ALUMINUM	50.0	---
ARSENIC	1.0	1.0
BORON	50.0	---
CADMIUM	0.2	1.0
CHROMIUM	4.0	5.0
COBALT	5.0	---
COPPER	2.0	2.0
CYANIDE	1.0	1.0
IRON	10.0	10.0
LEAD	1.0	2.0
MANGANESE	5.0	---
MERCURY	0.05	---
MOLYBDENUM	1.0	---
NICKEL	2.0	3.0
SILVER	1.0	---
ZINC	3.0	4.0
BOD	500	---
CHLOROPHENOL	0.05	---
PHENOL	1.0	1.0
O&G (animal)	150	150
O&G (petrol)	15	15
SULPHATE	1500	---
SULPHIDE	1.0	---
TSS	600	600

NOTE: Metal limits are expressed as totals, which include both the dissolved and undissolved components.

* The limits could be more stringent, or be specified for contaminants not on this list, if deemed necessary by the Sewage Control Manager.

7.06 Draft Stack Emission Limits for Biomedical Waste Incinerators *

(Concentrations corrected to 11% O_2 at reference conditions of dry gas at 20°C and 101.3 kPa)

TABLE 1
Stack Emission Limits for Biomedical Waste Incinerators
(Concentrations corrected to 11% O_2
at reference conditions of dry gas at 20°C and 101.3kPa)

CONTAMINANT	LIMIT	AVERAGING PERIOD	MONITORING METHOD
Total Particulate	20 mg/m^3	(1)	(2)
Opacity	5%	1-hour average from data taken every 10 seconds	Continuous monitoring
Carbon Monoxide	55 mg/m^3	4-hour rolling average	Continuous monitoring
Sulphur Dioxide	250 mg/m^3	(1)	(2)
Nitrogen Oxides (NO_x as NO_2)	350 mg/m^3	(1)	(2)
Hydrogen Chloride	70 mg/m^3 or 90% removal	8-hour rolling average	Continuous monitoring
Hydrogen Fluoride	3 mg/m^3	(1)	(2)
Total Hydrocarbons (as Methane CH_4)	40 mg/m^3	(1)	(2)
Arsenic(3)	1 $\mu g/m^3$	(1)	(2)
Cadmium(3)	100 $\mu g/m^3$	(1)	(2)
Chromium(3)	10 $\mu g/m^3$	(1)	(2)
Lead(3)	50 $\mu g/m^3$	(1)	(2)
Mercury(3)	200 $\mu g/m^3$	(1)	(2)
Chlorophenols	1 $\mu g/m^3$	(1)	(2)
Chlorobenzenes	1 $\mu g/m^3$	(1)	(2)
Polyaromatic Hydrocarbons	5 $\mu g/m^3$	(1)	(2)
Polychlorinated Biphenyls	1 $\mu g/m^3$	(1)	(2)
Total PCDDs & PCDFs(4)	0.5 ng/m^3	(1)	(2)

(1) To be averaged over the approved sampling and monitoring method.

(2) All sampling and monitoring methods, including continuous monitors, are to be approved by the Regional Manager.

(3) The concentration is for total metal emitted as particulate and vapour.

(4) Expressed as International Toxicity Equivalency Factor (I-TEF) value should be estimated from isomer specific test data. If only homologue test data are available, then the largest equivalency factor should be used.

* Draft B.C. Ministry of Environment Emission Objectives for Biomedical Waste Incinerators

7.07 Facility Operations

Bidders are requested to provide information concerning their operations management approach to biomedical waste disposal operations. A preliminary operations plan incorporating Bidder's guidelines and procedures related to the proposed Biomedical Waste Treatment and Disposal Facility is required. A number of factors should be addressed including the following:

7.07.01 Staffing and Organization

Staffing and qualifications of staff for the proposed Facility should be identified.

7.07.02 Safety

Safety procedures and requirements for protective clothing for both employees and visitors should be outlined. The provisions for employee locker/shower/washroom facilities and visitors gallery isolated from the processing area are required.

7.07.03 Training

To ensure effective and safe operation and maintenance of the Facility, an employee training program is required. The proposed employee training procedures should be outlined.

7.07.04 Internal Noise and Odour

Provisions to maintain acceptable noise levels and prevent and control odour are required.

7.07.05 Contingency Plans

Causes of malfunction of the Facility or of abnormal operation will occur. Potential deviations from normal Facility operation and their remedies are to be described such as those caused by:

- Downtime
- Power outage
- Equipment or process failure

- Failure of other facility components
- Annual and periodic maintenance shutdowns
- Abnormal fluctuations in waste supply
- Border closings
- Residue disposal site closure

7.08 Costs, Financing, Bonding, and Permits

Each Bidder is asked to provide his estimate of the capital cost for the design, site approvals, supply, construction, commissioning, start-up and testing of the Treatment and Disposal Facility or Facilities offered in response to this RFP. The Bidder's expected operating costs and management fee is requested. A breakdown of the capital and operating costs shall be submitted with the proposal.

Although this RFP is based on private financing which is preferred at this time, alternatives will be considered including public financing, or a joint financing arrangement. The right to purchase the Facility or Facilities is required on a basis to be incorporated in the Contract Agreement. A $2.5 million Bond or other suitable form of guaranty will be required to ensure performance and fulfillment of the design and construction of the plant and payment for labour and material. This Bond or guaranty will be supplemented by a $2.5 million Operating Bond or other suitable form of guarantee (for 10 years) after the system has been proven and accepted.

The approval and permitting processes will be undertaken by the selected Bidder at his expense after receiving a qualified Letter of Intent. In view of the urgency of project completion and start-up, a guarantee of meeting schedule commitments will be required.

7.09 Performance Testing

After each Biomedical Waste Treatment Facility is in full operation and within one month of initial operations receiving and processing biomedical waste, the capability of the facility

to fully comply with all requirements of the Contract, provincial regulations, federal regulations and requirements established by the approvals process, shall be thoroughly tested at the Contractor's expense and witnessed by the contracting authority's authorized representatives. Detailed performance data including measurement and analyses of inputs, emissions, effluents and residues will be obtained for one week of operation at a rate close to the design maximum for at least 48 hours and at the lowest expected operating rate for a period of 96 hours. In addition, operating data will be obtained, operations observed and records reviewed for a period of one month. If the data obtained does not comply with the contract requirements, corrective measures will be proposed by the Contractor to the Contracting Agency and after agreed modification if necessary, the performance test will be repeated at the Contractor's expense. This will continue until a successful test results or the Contracting Agency concludes that the Contractor has shown inability to meet his contractual committment and that other action is required.

7.10 Technical Information

In addition to the general information and description requested about each waste treatment facility including storage/transfer facilities proposed as part of the province-wide biomedical waste system and required to evaluate each Bidder's proposal, it is requested that the technical data and drawings listed below, where applicable, be included for each facility:

- Site layout plan to approximate scale 1:500 or 1 inch = 40 feet (Dimensions preferrably in metric S.I. units but English units are acceptable).
- Site location and sketch showing vehicle access routes, services and utilities.
- Types of biomedical waste to be treated, process(es) to be employed, design peak capacities and average throughputs.
- Size and capacity of waste transport vehicle and trailer parking space, number of unloading bays and expected frequency of deliveries.
- Method and facilities for cleaning and decontamination of transport vehicles and disposing of resulting effluent.

- Plan and sections of the proposed waste receiving, storage and treatment building(s).
- Method and facilities for unloading of waste and transporting within the building(s), to and from storage and for handling spills and damaged containers.
- Size and capacity of refrigerated storage space, description and capacity of refrigerated system and provision for refrigeration failure.
- Detailed description of proposed incinerator, name of manufacturer, dimensioned drawings, design capacity, construction details, control details, detailed operating description, allowance for outages, organic and carbon content of bottom ash, and examples of similar operating installations with description of each, date of initial operation, performance history and name of owner (see also Sections 5.02 and 5.03).
- Detailed description of gas cooling and cleaning system, name of supplier, operating conditions, normal and peak emission levels, bases for stated emission control levels, composition of effluents and/or residues from the system and proposed method(s) of disposal.
- Construction and size of main stack and also emergency vent if proposed.
- Detailed description of steam autoclave or other waste other waste treatment process proposed, name of manufacturer, types of biomedical waste to be treated, design capacity, construction details, equipment drawings, control details, testing program and facilities, control of emissions from ventilation system exhausts, auxiliaries required such as steam generating equipment or testing laboratory, detailed operating description, allowance for outages, decontamination of plant facilities, handling of containers damaged during autoclaving, disposal of decontaminated waste, disposal of effluents, and examples of similar operating installations with descriptions of each, date of initial operation, performance history, location and name of owner (see also Sections 6.05 to 6.08).
- Description of the facilities for personnel including locker rooms for clean and potentially contaminated clothing, showers, washrooms, lunchrooms.
- Description of the facilities for maintenance, the provision of spares and the program of preventative maintenance.
- Description of administrative office(s) and control room(s).
- Drawings showing plan and sections of the proposed layout of equipment, locker

rooms, offices and related facilities.

- Electric power connected load and estimated consumption lighting, building heating, air conditioning and general services, waste handling, storage and refrigeration, waste incineration, waste autoclaving, waste treatment by other processes and power for other uses.
- Water supply source and quantities required by various uses.
- Fuel consumption by fuel types and applications.
- Outputs of effluent with estimated compositions and quantities from each source including decontaminated biomedical liquid waste and methods of disposal.
- Outputs of solid residues with estimated compositions and quantities including bottom ash, fly ash, gas cleaning system residues, decontaminated biomedical waste and other solid residues with the method of disposal for each.
- Facility staff, functions, operating shifts.
- Capital cost breakdown and total including design, supply, construction, overhead and risk allowance where applicable for:

  _____ Approval and permitting process

  _____ Land acquisition

  _____ Site preparation

  _____ Buildings

  _____ Building services

  _____ Installed equipment including controls

  _____ Mobile and movable equipment

  _____ Laboratory equipment

  _____ Locker rooms and offices

  _____ Start-up and performance testing

  _____ Other (specify)

  _____ Total
- Estimated Canadian content of capital cost.

o Annual operating costs including:

_____ Labour

_____ Electric power

_____ Fuel

_____ Water

_____ Maintenance and repairs (averaged over 10 years)

_____ Total

o Time allowed from authorization to proceed for:

_____ Approval and permitting process

_____ Completing design, supply and construction

_____ Commissioning, start-up, run-in and successful performance test results

8 CONTRACT ADMINISTRATION

8.01 General

The Province and GVRD is in the process of selecting and seeking the required approvals and funding for a Contracting Agency to administer a contract for a Province-Wide Biomedical Waste Collection, Treatment and Disposal System which it is hoped will result from this RFP and subsequent negotiations. The organizational structure relating to the interrelationship between the Contracting Agency and appropriate provincial authorities has not been established. The Province and GVRD will perform the lead role through the negotiation to the development of the potential contract. Examples of functions which such an agency would perform during the initial phase of a potential contract include those listed below. The subsequent responsibility would essentially become ensuring the proper management of the collection, treatment and disposal of biomedical waste generated in British Columbia.

8.02 Contracting Agency Functions

- Participation in RFP final meeting, assessment and negotiation process with selected Bidders.
- Resolve issues relating from a Bidder withdrawing his bid after the proposal closing time or refusing to proceed to a contract.
- Review and propose modifications and additions to the contract terms and conditions developed by the Province and GVRD with their engineering and legal advisers and incorporating terms and conditions proposed by selected Bidders.
- Develop and propose reporting procedures related to administration of a potential biomedical waste system contract.
- Develop and propose a complete control organization and network for overseeing the contract between award date through the approvals, licensing permitting process, installation, commissioning, startup and testing, to full scale operation.

- Participate in establishing the performance bond requirements for the initial contract phase.
- Participate in establishing the types and quantities of biomedical and other waste to be supplied to the system.
- Participate in activities directed toward a waste reduction program.
- Establish all applicable communication linkages, procedures, record keeping, accounting, general reporting, public relations activities and the like.
- Clarify policies and procedures related to generators of biomedical waste and the suitability of control, packaging and identification of waste to be supplied to the collection system.
- Establish performance standards, procedures to monitor compliance, methods of assessing system user satisfaction and related reporting requirements.
- Negotiate changes in operating fees due to; inflation, changes in quantity and environmental standards.
- Assist, but not be liable for resolution of any disputes between the Contractor and users.

CA2BCPC 90R26
British Columbia Purchasing Commission.
REQUEST FOR PROPOSALS FOR MANAGEMENT OF BIOMEDICAL WA
FOR THE PROVINCE OF BRITISH COLUMBIA AND GREATER
VANCOUVER REGIONAL DISTRICT. 1991.

RESOURCE CENTRE
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